In the Claims:

1. (Currently Amended) An apparatus for micromachining a substrate comprising:

an open air region within which substrates can be processed;

a laser source operably positioned relative to the open air region to generate a laser beam configured to energize substrate material of a substrate positioned within the open air region; and

a gas supply that supplies a halogen containing assist gas into the open air region wherein at least some substrate material can be energized by the laser beam and wherein at least some of the energized substrate material can chemically react with the assist gas to form one or more compounds that ~~can~~ dissipate into the open air region, and wherein the halogen containing assist gas comprises a halosulfide.

2. (Original) The apparatus of claim 1, further comprising a fixture for positioning the substrate in the open air environment and upon which the substrate can be contacted by the laser beam and wherein the fixture can move the substrate in relation to the laser beam.

3. (Original) The apparatus of claim 1, further comprising a mechanism for moving the laser source relative to the substrate.

4. (Original) The apparatus of claim 1, further comprising a fixture that positions the substrate in the open air environment and upon which the substrate can be contacted by the laser beams and a mechanism that moves the laser source relative to the substrate, wherein the fixture and the mechanism can be used in combination to move the substrate in relation to the laser beam.

5. (Original) The apparatus of claim 1, wherein the laser beam is capable of energizing substrate material equal to or above a material removal threshold of the substrate.

6. (Original) The apparatus of claim 1, wherein the gas supply comprises at least one gas supply nozzle positioned to supply the assist gas in proximity to the substrate.

7. (Original) The apparatus of claim 6, wherein said at least one gas supply nozzle has a circular exit aperture.

8. (Original) The apparatus of claim 7, wherein said circular exit aperture has a diameter of about 1.0 mm.

9. (Cancelled)

10. (Original) The apparatus of claim 1, wherein the halogen containing assist gas comprises a halocarbon.

11. (Original) The apparatus of claim 10, wherein the halocarbon comprises a fluorocarbon.

12. (Original) The apparatus of claim 11, wherein the fluorocarbon comprises 1,1,1,2 tetrafluoroethane.

13. (Original) The apparatus of claim 1, wherein the laser beam has a peak power density of at least about 1 GW/cm2.

14. (Original) The apparatus of claim 1, wherein less than or equal to about 0.5 percent of the energized substrate material redeposits on the substrate.

15. (Original) The apparatus of claim 1, wherein the substrate comprises a semiconductor substrate for use in a fluid ejecting device.

16. (Original) The apparatus of claim 1, wherein the substrate comprises a wafer.

17. (Currently Amended) An apparatus for micromachining a substrate comprising:

a laser source operably positioned to generate a laser beam configured to make a cut by removing material from a substrate, wherein the laser beam is configurable to make a cut having an aspect ratio ranging from about 4.5 to about 11.25 and at said range of aspect ratios the laser beam removes greater than or equal to about 9,800,000 cubic microns of substrate material per joule of laser energy; and

a gas supply that supplies a halogen containing assist gas wherein at least some substrate material can be energized by the laser beam and wherein at least some of the energized substrate material can chemically react with the assist gas to form one or more compounds that can dissipate, and wherein the halogen containing assist gas comprises a halosulfide.

18. (Original) The apparatus of claim 17, wherein said substrate comprises crystalline silicon.

19. (Original) The apparatus of claim 17, wherein the laser beam has a wavelength between about 300 nm and about 1100 nm.

20. (Original) The apparatus of claim 17, wherein the laser beam has a wavelength of about 355 nm.

21. (Withdrawn) A method of processing a semiconductor substrate comprising:

positioning a substrate in an open air region;

energizing a portion of the substrate to promote removal of at least some substrate material; and,

introducing a halogen containing assist gas proximate to an energized portion of the substrate so that the assist gas chemically reacts with energized substrate material to form, at least in part, one or more volatile compounds.

22. (Withdrawn) The method of claim 21, wherein said act of energizing and said act of introducing form a slot in the substrate.

23. (Withdrawn) The method of claim 21, wherein said act of energizing and said act of introducing form a fluid feed slot in the substrate.

24. (Withdrawn) The method of claim 21, wherein said act of energizing and said act of introducing cuts the substrate into multiple pieces.

25. (Withdrawn) A method of laser micromachining a substrate comprising:

positioning a substrate in an open air environment, wherein the substrate has a thickness defined by opposing first and second surfaces; and,

cutting the substrate by directing a laser beam at the first surface of the substrate and introducing an assist gas proximate to a region of the substrate contacted by the laser beam.

26. (Withdrawn) The method of claim 25, wherein said introducing comprises introducing multiple assist gases.

27. (Withdrawn) The method of claim 25, wherein said cutting forms a slot generally free of redeposited substrate material.

28. (Withdrawn) The method of claim 25, wherein said cutting forms a slot generally free of redeposited substrate material during said act of cutting.

29. (Withdrawn) The method of claim 25, wherein said cutting forms a via having an aspect ratio of at least about 10.

30. (Withdrawn) The method of claim 25, wherein said cutting forms a via having an aspect ratio ranging from about 10 to about 20.

31. (Withdrawn) The method of claim 25, wherein said cutting forms a via having an aspect ratio of at least about 20.

32. (Withdrawn) The method of claim 25, wherein said cutting forms a slot at least a portion of which is contoured.

33. (Withdrawn) The method of claim 25 further comprising removing additional material from the substrate that, in combination with said cutting, forms a desired feature in the substrate.

34. (Withdrawn) The method of claim 33, wherein the removing is accomplished from the second surface of the substrate.

35. (Withdrawn) The method of claim 33, wherein the removing comprises one or more of: sand drilling, dry etching, wet etching, and mechanical machining.

36. (Withdrawn) The method of claim 33, wherein the removing comprises laser machining.

37. (Withdrawn) The method of claim 36, wherein said laser machining comprises laser machining with a laser beam having a wavelength different from the wavelength of the laser beam utilized in said cutting.

38. (Withdrawn) A method of processing a substrate comprising:

positioning a substrate in an open air environment;

projecting a laser beam at the substrate; and,

directing a halogen containing assist gas toward an area of the substrate contacted by the laser through one or more gas supply nozzles oriented at an angle between about 45 and about 90 degrees relative to a first surface of the substrate.

39. (Withdrawn) The method of claim 38, wherein said directing supplies sufficient concentrations of the assist gas to maintain the assist gas as an excess reagent.

40. (Withdrawn) The method of claim 38, wherein said directing supplies the assist gas at a rate of between about 0.08 gm/sec to about 0.5 gm/sec where the assist gas is 1,1,1,2 tetrafluorethane.

41. (Withdrawn) The method of claim 38, wherein said directing supplies the assist gas at a rate of about 0.33 gm/sec where the assist gas is 1,1,1,2 tetrafluorethane.

42. (Withdrawn) A method of processing a semiconductor substrate comprising:

directing a laser beam at a print head substrate positioned in an open air environment;

introducing a halogen containing assist gas proximate a region of the substrate at which the laser is directed; and,

wherein the laser beam in the presence of the assist gas forms a cut in the substrate having an aspect ratio of at least about 10.

43. (Withdrawn) The method of claim 42, wherein said introducing allows the laser beam to maintain a kerf in the substrate of essentially uniform dimensions during the cut.

44. (Withdrawn) A method of processing a semiconductor substrate comprising:

positioning a substrate in an open air region for processing; and,

removing material from the substrate by directing a laser beam and a halogen containing assist gas at a portion of the substrate, wherein less than about 1.0 percent of removed substrate material redeposits on the substrate.

45. (Withdrawn) A method of laser micromachining a substrate comprising:

positioning a substrate to be contacted by a laser beam; and,

directing a laser beam at the substrate to form a cut having an aspect ratio in a range from about 4.5 to about 11.25, and wherein said directing removes at least about 9,800,000 cubic microns of substrate material per joule of laser energy for said range of aspect ratios.

46. (Withdrawn) The method of claim 45, wherein said directing comprises directing a laser beam having a wavelength between about 300 nm and about 1100 nm.

47. (Withdrawn) The method of claim 45, wherein said directing comprises directing a laser beam having a wavelength of about 355 nm.

48. (Withdrawn) The method of claim 45, wherein said directing removes substrate material at a generally constant removal rate through the depth of the cut.

49. (Withdrawn) A method of processing a substrate comprising:

positioning a substrate in an open air environment;

cutting substrate material by directing a laser beam at the substrate and providing an assist gas to an area of the substrate contacted by the laser beam; and,

wherein said cutting occurs in the open air environment, and wherein said cutting process maintains a generally constant cutting rate for the depth of the cut.

50. (Withdrawn) The method of claim 49, wherein said cutting dices the substrate into multiple pieces.

51. (Withdrawn) A method of cutting features on a semiconductor substrate comprising:

positioning a substrate in an open air environment;

supplying an assist gas to an area of the substrate to be cut; and,

cutting a feature into the substrate by directing a laser beam at the substrate in the presence of the assist gas to form a feature having an aspect ratio of greater than or equal to 10.

52. (Withdrawn) The method of claim 51, wherein said cutting a feature comprises making multiple laser beam passes over the substrate to achieve said feature.

53. (Withdrawn) One or more computer-readable media having computer readable instructions thereon which, when executed by a computer, cause the computer to:

cause a laser beam to be directed at a substrate positioned in an open air environment; and,

cause an assist gas to be introduced to a region where the laser beam contacts the substrate.

54. (Withdrawn) A method of processing a semiconductor substrate comprising:

means for positioning a substrate in an open air region;

means for energizing a portion of the substrate to promote removal of at least some substrate material; and,

means for introducing an assist gas proximate an energized portion of the substrate so that the assist gas chemically reacts with energized substrate material to form at least in part one or more volatile compounds.